



| Technical Data | | AFB24-SR, AFB24-SR-S, AFX24-SR, AFX24-SR-S |
|--|--------------|---|
| Power supply | | 24 VAC ±20%, 50/60 Hz 24 VDC +20% / -10% |
| Power consumption | running | 5.5 W |
| | holding | 3 W |
| Transformer sizing | | 8.5 VA (class 2 power source) |
| Electrical connection | | |
| | AFB... | 3 ft, 18 GA appliance cable, 1/2" conduit connector -S models: two 3 ft, 18 gauge appliance cables with 1/2" conduit connectors |
| | AFX... | 3 ft [1m], 10 ft [3m] or 16 ft [5m] 18 GA appliance or plenum cables, with or without 1/2" conduit connector -S models: Two 3 ft [1m], 10 ft [3m] or 16 ft [5m] appliance cables, with or without 1/2" conduit connectors |
| Overload protection | | electronic throughout 0 to 95° rotation |
| Operating range Y | | 2 to 10 VDC, 4 to 20mA |
| Input impedance | | 100 kΩ for 2 to 10 VDC (0.1 mA) 500 Ω for 4 to 20 mA |
| Feedback output U | | 2 to 10 VDC (max. 0.5 mA) |
| Torque | | 180 in-lb [20 Nm] minimum |
| Direction of rotation | spring motor | reversible with CW/CCW mounting reversible with built-in switch |
| Mechanical angle of rotation | | 95° (adjustable with mechanical end stop, 35° to 95°) |
| Running time | spring | < 20 seconds @ -4°F to 122°F [-20°C to 50°C]; < 60 seconds @ -22°F [-30°C] |
| | motor | 95 seconds |
| Position indication | | visual indicator, 0° to 95° (0° is full spring return position) |
| Manual override | | 5 mm hex crank (3/16" Allen), supplied |
| Humidity | | max. 95% RH non-condensing |
| Ambient temperature | | -22°F to 122°F [-30°C to 50°C] |
| Storage temperature | | -40°F to 176°F [-40°C to 80°C] |
| Housing | | Nema 2, IP54, Enclosure Type2 |
| Housing material | | zinc coated metal and plastic casing |
| Agency listings† | | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EC & 2006/95/EC |
| Noise level | | ≤40dB(A) motor @ 95 seconds ≤62dB(A) spring return |
| Servicing | | maintenance free |
| Quality standard | | ISO 9001 |
| Weight | | 4.6 lbs (2.1 kg); 4.9 lbs (2.25 kg) with switches |
| † Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3. | | |
| AFB24-SR-S, AFX24-SR-S | | |
| Auxiliary switches | | 2 x SPDT 3A (0.5A) @ 250 VAC, UL approved one set at +10°, one adjustable 10° to 90° |

Torque min. 180 in-lb, for control of air dampers

Application

For proportional modulation of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications.

The actuator is mounted directly to a damper shaft up to 1.05" in diameter by means of its universal clamp. A crank arm and several mounting brackets are available for applications where the actuator cannot be direct coupled to the damper shaft.

The actuator operates in response to a 2 to 10 VDC, or with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. A 2 to 10 VDC feedback signal is provided for position indication. Not to be used for a master-slave application.

Operation

The AFB and AFX series actuators provide true spring return operation for reliable fail-safe application and positive close-off on air tight dampers. The spring return system provides constant torque to the damper with, and without, power applied to the actuator.

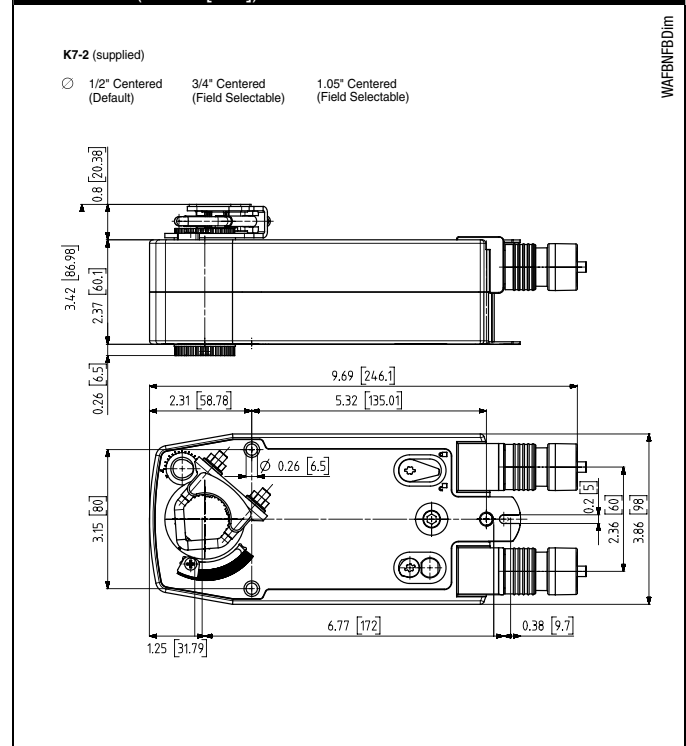
The AFB and AFX series provides 95° of rotation and is provided with a graduated position indicator showing 0° to 95°.

The AFB24-SR and AFX24-SR uses a brushless DC motor which is controlled by an Application Specific Integrated Circuit (ASIC) and a microprocessor. The microprocessor provides the intelligence to the ASIC to provide a constant rotation rate and to know the actuator's exact fail-safe position. The ASIC monitors and controls the brushless DC motor's rotation and provides a digital rotation sensing function to prevent damage to the actuator in a stall condition. The actuator may be stalled anywhere in its normal rotation without the need of mechanical end switches.

The AFB24-SR-S and AFX24-SR-S versions are provided with two built-in auxiliary switches. These SPDT switches provide safety interfacing or signaling, for example, for fan start-up. The switching function at the fail-safe position is fixed at +10°, the other switch function is adjustable between +10° to +90°. The AFB24-SR, AFB24-SR-S, AFX24-SR and AFX24-SR-S actuator is shipped at +5° (5° from full fail-safe) to provide automatic compression against damper gaskets for tight shut-off.

ATTENTION: AFB24-SR(-S) and AFX24-SR(-S) **cannot** be tandem mounted on the same damper or valve shaft. Only On/Off and MFT AF models can be used for tandem mount applications.

Dimensions (Inches [mm])



AFB24-SR, AFB24-SR-S, AFX24-SR, AFX24-SR-S

Proportional, Spring Return, 24 V, for 2 to 10 VDC to 4 to 20 mA Control Signal



Accessories

| | |
|-----------|--|
| AV 8-25 | Shaft extension |
| IND-AFB | Damper position indicator |
| KH-AFB | Crank arm |
| K7-2 | Universal clamp for up to 1.05" dia jackshafts |
| TF-CC US | Conduit fitting |
| Tool-06 | 8mm and 10 mm wrench |
| ZG-100 | Universal mounting bracket |
| ZG-101 | Universal mounting bracket |
| ZG-118 | Mounting bracket for Barber Colman® MA 3./4... , Honeywell® Mod III or IV or Johnson® Series 100 replacement or new crank arm type installations |
| ZG-AFB | Crank arm adaptor kit |
| ZG-AFB118 | Crank arm adaptor kit |
| ZS-100 | Weather shield (metal) |
| ZS-150 | Weather shield (polycarbonate) |
| ZS-260 | Explosion-proof housing |
| ZS-300 | NEMA 4X housing |

NOTE: When using AFB24-SR, AFB24-SR-S, AFX24-SR and AFX24-SR-S actuators, only use accessories listed on this page.

For actuator wiring information and diagrams, refer to Belimo Wiring Guide.

Typical Specification

Spring return control damper actuators shall be direct coupled type which require no crank arm and linkage and be capable of direct mounting to a jackshaft up to a 1.05" diameter. The actuator must provide proportional damper control in response to a 2 to 10 VDC or, with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. The actuators must be designed so that they may be used for either clockwise or counterclockwise fail-safe operation. Actuators shall use a brushless DC motor controlled by a microprocessor and be protected from overload at all angles of rotation. Run time shall be constant, and independent of torque. A 2 to 10 VDC feedback signal shall be provided for position feedback. Actuators shall be cULus Approved and have a 5 year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

Wiring Diagrams

INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment Damage!**
Actuators may be connected in parallel. Power consumption and input impedance must be observed.
Up to 4 actuators may be connected in parallel if not mechanically mounted to the same shaft. With 4 actuators wired to one 500 Ω resistor. Power consumption must be observed.
- 3 Actuator may also be powered by 24 VDC.
- 4 For end position indication, interlock control, fan startup, etc., AFB24-SR-S and AFX24-SR-S incorporates two built-in auxiliary switches: 2 x SPDT, 3A (0.5A) @250 VAC, UL Approved, one switch is fixed at +10°, one is adjustable 10° to 90°.
- 5 Only connect common to neg. (-) leg of control circuits

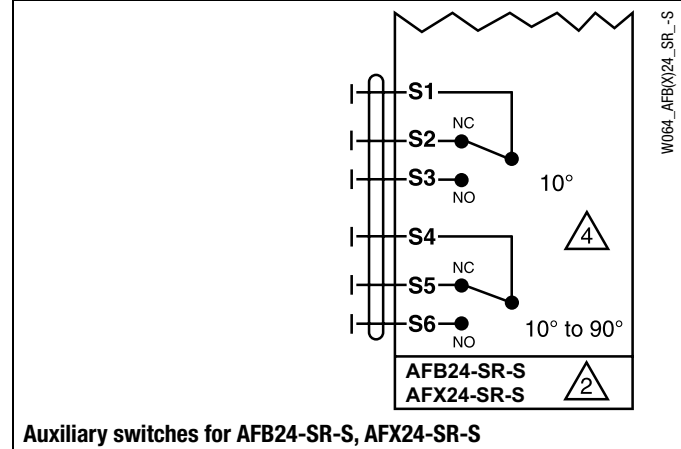
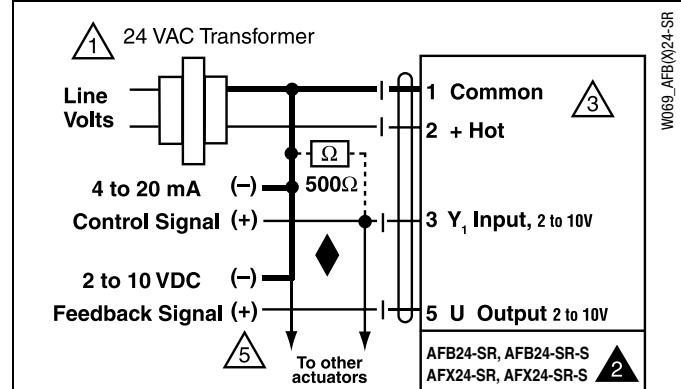
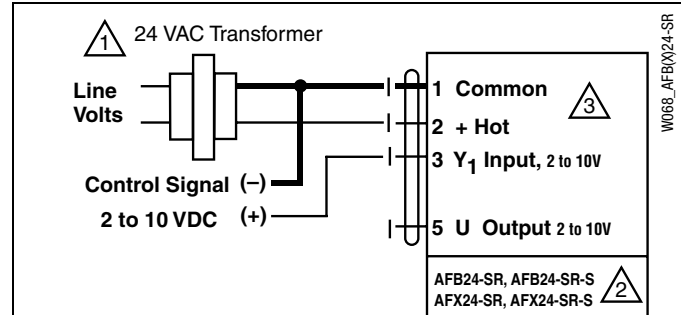
APPLICATION NOTES

- ◆ The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC.

ATTENTION: AFB24-SR(-S) and AFX24-SR(-S) **cannot** be tandem mounted on the same damper or valve shaft. Only On/Off and MFT AF models can be used for tandem mount applications.

WARNING Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



06/10 - Subject to change. © Belimo Aircontrols (USA), Inc.